



KONTI
HIDROPLAST®

PRODUCTION OF POLYETHYLENE
AND POLYPROPYLENE PIPES



PE 100 / PE 100-X
PETROL GAS PIPES

www.konti-hidroplast.com.mk



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KONTI HIDROPLAST®

WELCOME TO OUR WORLD

Konti Hidroplast is part of the world's largest manufacturer and supplier of high performance plastic pipes and offers the best and the most cost effective pipe systems for its customers.

Konti Hidroplast specialises in polyethylene pipe systems for gas and water transportation in the utilities and industrial markets.

MARKET ORIENTED

Konti Hidroplast products find a broad range of applications in the industrial and utilities market on a worldwide scale.

The water and gas distribution enterprises are important sectors for high integrity products where the maintenance of water quality and the safe transport of gaseous fuels are of paramount importance.

Industrial applications include alternative energy installations in landfill gas systems to effluent transportation and mineral slurry.

Products are widely used in pipeline installation, repair and maintenance.

Many of the brands in the Konti Hidroplast portfolio have a long record of innovation in meeting the needs of the water and gas utilities.

Being one of the foremost pioneers in polyethylene pipe systems, Konti Hidroplast is continually improving and updating its offer to meet the ever growing needs of the distribution engineer; ensuring they stay at the forefront of world gas and water distribution/treatment systems.





CUSTOMER FOCUS

The key to our success lies in the commitment to provide the highest quality service and support. We are a team of highly motivated and experienced individuals.

We place the utmost importance on meeting the needs of our customers, constantly evolving our extensive product portfolio to meet the ever changing demands of the water and gas utilities, industrial and foreign markets.

QUALITY

Konti Hidroplast is a result-driven business – its people, products and service. Designed, manufactured and supplied under EN ISO 9001:2000 accredited Quality Management Systems, Konti Hidroplast products comply with relevant national, European and international product standards to ensure complete reliability for our customers.

Besides the ISO certificates for Quality Management Systems and ecology, the gas pipes are also certified by DVGW CERT GmbH.

THE ENVIRONMENT

Committed to sustainable manufacture and systems, Konti Hidroplast operates and maintains an environmental policy fully accredited by ISO 14001.

KONTI PETROL GAS

The transport of oil products, liquid chemicals, hot water and distribution of gas in extreme condition poses everyday challenges for engineering companies and piping system producers.

Because of the combination of strict technical constraints, such as pressure, temperature and chemicals, traditional plastic materials are not usually selected for these extreme application: when the environment becomes too corrosive for steel, too hot for ordinary PE pipes, when high mechanical resistance is required, when the condition of the inner surface becomes essential for deposits prevention.

PE 100/PE 100-X pipes are new products of Konti Hidroplast – high performance PE pipes:

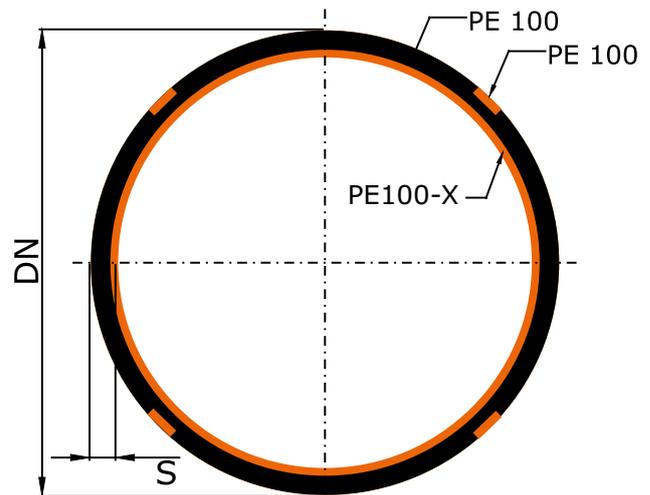
POLYETHYLENE KONTI-PETROL-GAS PIPE

These high performance pipes can be used for the following applications:

- Transport of petrol products to petrol stations and oil refineries
- Gas distribution
- Special industrial application
- Geothermal and district heating



POLYETHYLENE KONTI-PETROL-GAS PIPE



$$S = S_1 (90\%) + S_2 (10\%)$$

KONTI-PETROL-GAS pipe is a double wall pipe with outside black layer made of PE 100 material and coextruded inside layer PE 100-X cross linkable polyethylene in orange colour and outside coextruded axial lines in orange colour.

The inside layer made of PE 100-X is 10% of the total wall thickness of the pipe. 90% is the outside layer-standard PE 100 material. The total wall thickness does not exceed the standard wall thickness of PE 100 pipe.

Because PE 100-X is in the classification of PE 100, for the polyethylene PE 100 KONTI-PETROL-GAS pipe the same standards are valid as for the classic PE i.e. EN 1555 or ISO 4437 standards.

Besides the ISO certificates for Quality management system and ecology, the gas pipes are also certified by DVGW CERT GmbH.

ADVANTAGES OF THE PE 100-X INSIDE LAYER

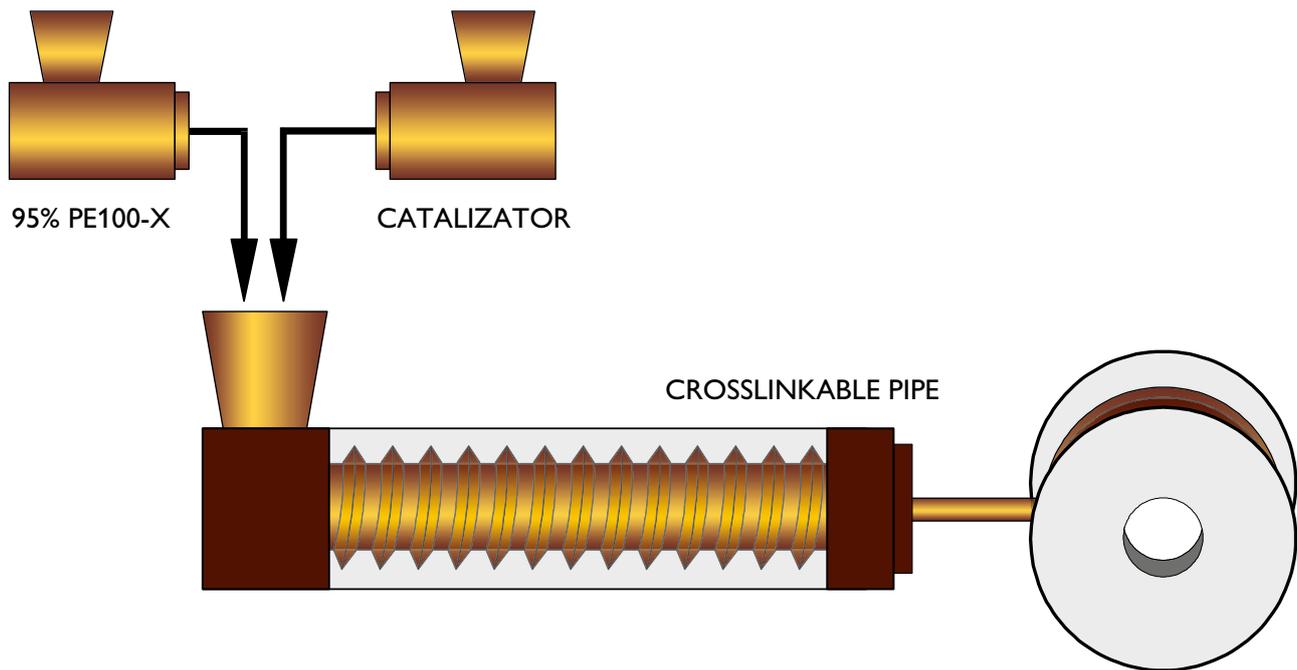
- Good resistance to emission of volatile organic compounds from the oil derivatives and their prevention from crossing into the environment
- Protection of ground water against contamination often associated with corroded and leaking steel pipes
- Resistance to extreme temperatures -35°C to +85°C
- Increased chemical resistance of the pipe
- Excellent abrasion resistance

	PE 100-X	PE 100	PEX A	PEX B	PEX C	STEEL
HIGH T° LTHS	++	—	+	+	+	+++
MRS (20 °C)	++	+	—	—	—	+++
CORROSION AND CHEMICAL RESISTANCE	++	+	++	++	++	—
ESC	++	+	n.a	n.a	n.a	n.a
RCP	++	+	n.a	n.a	n.a	n.a
FLEXIBILITY	+	++	++	++	++	—
BUTT FUSION WELDING	+	++	—	+	—	n.a
COEXTRUSION	+	+	—	+	—	n.a

PRODUCTION TECHNOLOGY OF PE 100/PE 100-X

The production technology of PE 100/PE 100-X does not differ much from the usual co-extrusion polyethylene pipe technology.

The PE 100-X layer is produced with co-extrusion of /PE 100-cross linkable polyethylene Silan type material (cross-linkable ready-to-use). The PE 100-X layer contains draft polyethylene material and 5% of catalyst added before production.



After production, the cross-linking can be made in solid state, using the following methods:

- Placing the pipe in a high-temperature water bath for several hours, or in a steam sauna.
- Installing the network and cross-linking using circulating hot water.
- Ultimately, if the installed pipe is not placed into operation immediately in the anticipated extreme conditions, it will cross-link on its own by the existing ambient conditions in a period of a few months.

DIMENSION AND STANDARD CLASSES

PE 100/PE 100-X pipes are manufactured in dimensions of 20 mm up to 250 mm.

$$\text{STANDARD DIMENSION RATE (SDR)} = \frac{\text{NOMINAL OUTSIDE DIAMETER}}{\text{MINIMAL WALL THICKNESS}}$$

TABLE OF DIMENSION AND SDR

OD (mm)	SDR 17.6/17 S 8.3/8		SDR 11		SDRP 7.4 S 5		SDR 6 S 2.5	
	S (mm)	WEIGHT kg/m	S (mm)	WEIGHT kg/m	S (mm)	WEIGHT kg/m	S (mm)	WEIGHT kg/m
16	-	-	-	-	2.3	0.100	2.7	0.115
20	-	-	2.3	0.120	2.8	1.154	3.4	0.180
25	2.3	0.150	2.3	0.150	3.5	0.240	4.2	0.278
32	2.3	0.200	2.9	0.272	4.4	0.386	5.4	0.454
40	2.4	0.295	3.7	0.430	5.5	0.600	6.7	0.701
50	3.0	0.453	4.6	0.666	6.9	0.936	8.3	1.09
63	3.8	0.721	5.8	1.05	8.6	1.47	10.5	1.73
75	4.5	1.02	6.8	1.47	10.3	2.09	12.5	2.44
90	5.4	1.46	8.2	2.12	12.3	3.00	15.0	3.51
110	6.6	2.17	10.0	3.14	15.1	4.49	18.3	5.24
125	7.4	2.76	11.4	4.08	17.1	5.77	20.8	6.75
140	8.3	3.46	12.7	5.08	19.2	7.25	23.3	8.47
160	9.5	4.52	14.6	6.67	21.9	9.44	26.6	11.0
180	10.7	5.71	16.4	8.42	24.6	11.9	29.9	14.0
200	11.9	7.05	18.2	10.4	27.4	14.8	32.3	17.2
225	13.4	8.93	20.5	13.1	30.8	18.6	37.4	21.8
250	14.8	11.0	22.7	16.2	34.2	23.0	41.6	27.0

TRANSPORT OF OIL AND OIL DERIVATIVES

Beside steel, standard HDPE and other pipes, the oil business is still seeking for suitable pipe materials which will meet its needs.

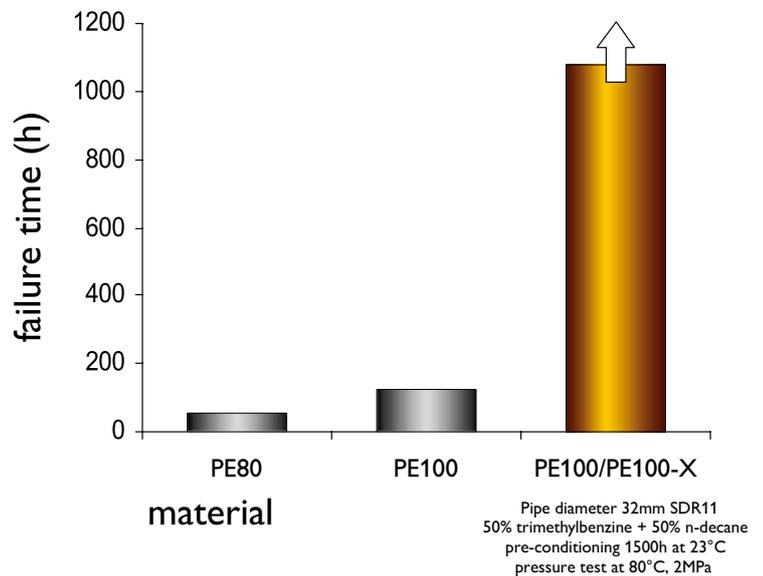
The PE 100/PE 100-X are resistant to working temperatures of up to 95°C and have good chemical resistance to oil, unleaded petrol, petrol and other oil derivatives.

It is the ideal solution for installation pipes for oil derivatives in petrol stations.

Compared with traditional pipe materials, the PE 100/PE 100-X pipes give the best compromise of properties for:

- High pressure resistance at high temperatures
- Increased resistance to micro porous permeability of oil and oil derivatives
- Better chemical and corrosion resistance
- Outstanding resistance to gas condensates which are present in gas fuels especially at low temperatures

The resistance to gas condensates is shown in the graph below:

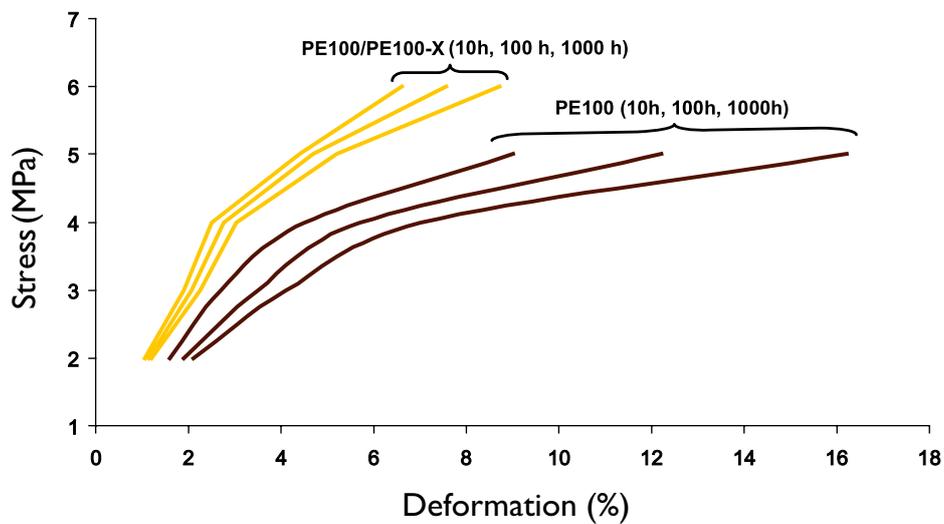


GEOHERMAL AND DISTRICT HEATING

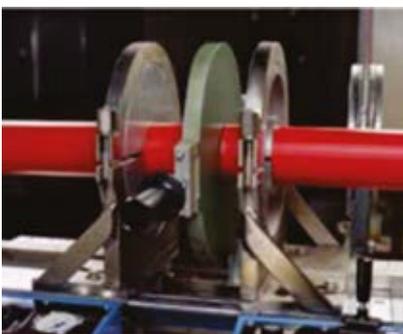
Pipes for geothermal and district heating should not only be pressure resistant, the material used must also retain its performance for durability at high temperatures where traditional polyethylene pipes have limited applicability.

The PE 100/PE 100-X pipes are the optimal solution for this application, as it is shown in the graph below:

HIGH TEMPERATURE (80°C) CREEP BEHAVIOUR



Furthermore, these pipes have good flexibility, can be produced into coil and they are very easy for installation.





DISTRIBUTION OF GAS

The PE, especially PE 100 pipes are a referent material for transport and distribution of gas.

However, in cases of more aggressive and more extreme conditions of exploitation, the PE 100 and the PE 100-X pipes are used.

The advantages of these pipes are:

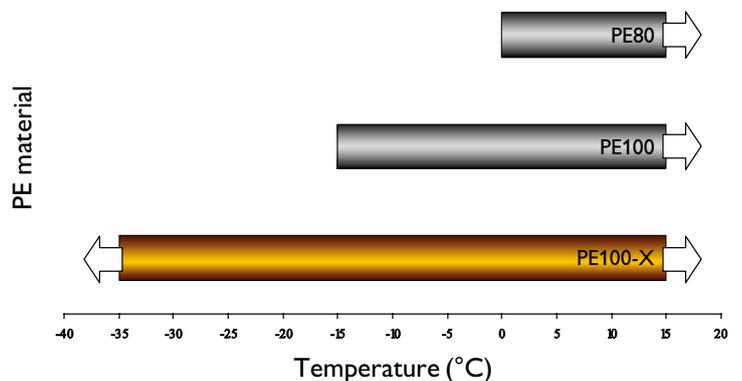
- decrease of installation costs and
- high performance in extreme working conditions

OPERATING THE PE 100/ PE 100-X PIPES IN EXTREME CONDITIONS

The PE 100/PE 100-X pipes can be used in extreme conditions of exploitation:

- In regions where the ground temperature is below 0 °C
- For over ground application, such as bridge crossings
- In pressure reducing stations where a significant drop of temperatures can be detected

The following graph shows the minimum working temperatures for different PE materials based on critical temperatures according to the S4 test:



CONNECTING THE PE 100/PE 100-X PIPES

PE 100/PE 100-X gas pipes can be easily connected using the classic methods of welding of polyethylene pipes:

- Electro fusion welding
- Butt welding
- Mechanical fittings

There are a wide range of fitting products for butt welding and electro fusion for connecting the PE 100/PE 100-X pipes.

PACKAGING

The PE 100/PE 100-X pipes are packed in the standard way, same as the regular polyethylene pipes.

Dimensions of up to Ø110 are produced in coils, whereas the bigger of up to Ø250 are produced in straight form pipes of 6 and 12 m.



FITTINGS





CERTIFICATES



LABORATORY TESTING

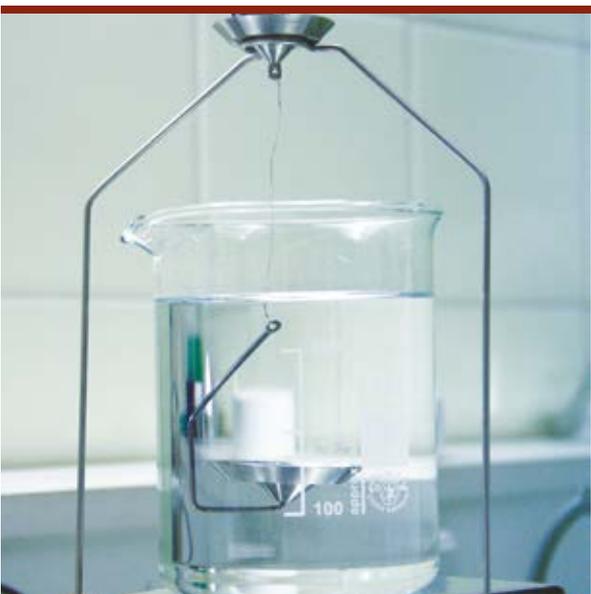
MELT MASS-FLOW RATE



LONGITUDINAL REVERSION



DENSITY



ELONGATION AT BREAK



HYDROSTATIC STRENGTH AT 80° AND 20° C





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ISO 9001:2008 No. 01442/0
ISO 14001:2004 No. 00211/0

MAY, 2019